

Claims

1. A polymer in the solid state obtainable by reaction of at least one polymer A prepared from

- at least one monomer a selected from among unsaturated monocarboxylic and dicarboxylic acids and analogs of unsaturated monocarboxylic and dicarboxylic acids,

and

- optionally, at least one ethylenically unsaturated monomer b,

with at least one polymer B which is terminated at one end by end groups which are not reactive under customary reaction conditions and is hydroxy- or amine-functionalized at the other end,

and, optionally, at least one amine C.

2. A polymer in the solid state obtainable by reaction of at least one monomer a selected from among unsaturated monocarboxylic and dicarboxylic acids and analogs of unsaturated monocarboxylic and dicarboxylic acids,

in the presence of a free-radical former

with at least one monomer c selected from the group consisting of unsaturated esters and amides of a polymer B which is terminated at one end by end groups which are not reactive under customary reaction conditions and is hydroxy- or amine-functionalized at the other end,

and, optionally, at least one ethylenically

unsaturated monomer **b**.

3. The polymer in the solid state as claimed in claim 1 or 2, characterized in that the analog of the unsaturated monocarboxylic or dicarboxylic acid is selected from the group consisting of acid salts, acid halides, acid anhydrides and esters.
4. The polymer in the solid state as claimed in any of the preceding claims, characterized in that the polymer **B** which is terminated at one end by end groups which are not reactive under customary reaction conditions and is hydroxy- or amine-functionalized at the other end has the following formula:
- $$X-(EO)_x-(PO)_y-(BuO)_z-R$$
- where x, y, z are each, independently of one another, in the range 0-250 and $x+y+z=3$ or above;
X=OH or NHR', where R'=alkyl having 1-20 carbon atoms, alkylaryl having 7-20 carbon atoms or H, preferably R'=H;
EO=ethylenoxy, PO=propylenoxy, BuO=butylenoxy or isobutylenoxy;
and R=alkyl having 1-20 carbon atoms or alkylaryl having 7-20 carbon atoms.
5. The polymer in the solid state as claimed in any of the preceding claims, characterized in that the polymer **B** contains bifunctional polymer impurities in a proportion by weight of less than 3% by weight, preferably less than 2% by weight, in particular less than 1% by weight, based on the weight of the polymer **B**.

6. The polymer in the solid state as claimed in claim

- 4 or 5, characterized in that the proportion by weight of the sum of propylene oxide (PO) and butylene oxide (BO) units does not exceed 29% by weight of the polymer B, in particular is less than-20%.
5. 7. The polymer in the solid state as claimed in any of the preceding claims, characterized in that monomer a is maleic acid, itaconic acid or crotonic acid, preferably acrylic acid or methacrylic acid.
- 10 8. The polymer in the solid state as claimed in any of the preceding claims, characterized in that the molecular weight of the polymer B is about 120-20 000 g/mol, in particular about 250-10 000 g/mol.
- 15 9. The polymer in the solid state as claimed in any of the preceding claims, characterized in that the polymer A has a molecular weight in the range 1000-100 000 g/mol, preferably 1000-50 000 g/mol, particularly preferably 2000-30 000 g/mol, in particular 2000-15 000 g/mol.
- 20 10. The polymer in the solid state as claimed in any of the preceding claims, characterized in that the molar ratio of the monomer building blocks a and b in the polymer A is in the range 100:0-20:80, preferably 100:0-30:70, in particular 98:2-70:30.
- 25 30 11. The polymer in the solid state as claimed in any of the preceding claims, characterized in that the polymer in the solid state is in the form of powder, flakes or in sheets.
- 35 12. The polymer in the solid state as claimed in any of the preceding claims, characterized in that at

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least one concrete fluidizer is added to the polymer prior to solidification.

13. The polymer in the solid state as claimed in any
5 of the preceding claims, characterized in that at
least one additive for hydraulically or latently
hydraulically setting binders from the group
consisting of setting retarders, setting
accelerators, viscosity modifiers and shrinkage
10 reducers is added to the polymer prior to
solidification.
14. A process for preparing a polymer in the solid
state as claimed in claim 1 or any of claims 3-13,
15 characterized in that the polymer in the solid
state is obtained by cooling a polymer melt and
is, optionally, comminuted to give a transportable
form.
15. A process for preparing a polymer in the solid
20 state as claimed in any of claims 2-13 by
copolymerization of at least one ethylenically
unsaturated monomer containing carboxyl groups or
analogous thereof with at least one ester or amide
25 of ethylenically unsaturated monocarboxylic or
dicarboxylic acids with a polymer B and,
optionally, further, copolymerizable monomers and,
optionally, in a solvent which is subsequently
removed.
16. The process for preparing a polymer in the solid
30 state as claimed in claim 14 or 15, characterized
in that water-soluble or water-dispersible
accelerators for the curing reaction of the
35 polymer melt are added to the polymer melt prior
to cooling.
17. The process for preparing a polymer in the solid

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- state as claimed in claim 16, characterized in that accelerators selected from the group consisting of inorganic and organic salts, urea and higher alcohols are used as water-soluble or water-dispersible accelerators for the solidification reaction of the polymer melt.
18. The use of the polymer in the solid state as claimed in any of claims 1 to 13 as dispersant for aqueous dispersions.
19. The use of the polymer in the solid state as claimed in any of claims 1 to 13 as fluidizer for hydraulically setting systems.
20. The use of the polymer in the solid state as claimed in any of claims 1-13 as fluidizer in ready-to-use mortar systems.
21. The use of the polymer in the solid state as claimed in any of claims 1-13 dissolved in water as fluidizer for cement-containing systems.
22. An aqueous solution obtained by dissolving the polymer in the solid state as claimed in any of claims 1-13 in water.